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भारतीय मानक
Indian Standard

IS 15524 : 2018

स्वचल मोटर वाहन — पूर्व उपचारित प्रक्रिया द्वारा टायरों की रिट्रेडिंग — विशिष्टि

(पहला पुनरीक्षण)

Automotive Vehicles — Retreading of Tyres by the Pre-Cured Process — Specification

(First Revision)

ICS 83.160.10

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Automotive Tyres, Tubes and Rims Sectional Committee, TED 7

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Tyres, Tubes and Rim Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 2004. This standard has been revised to keep pace with the latest technological advancement in the field of retreading of tyres by pre-cured process for automotive vehicles. This standard has been undertaken after due consideration of the practices prevalent in the industry. Following are some of the salient features of this standard:

a) Requirement clauses has been modified as per the correct reference of standards.
b) Typographical errors have been corrected and appropriate words have been added to convey the correct meaning.
c) Physical properties for precured tread rubber, bonding/cushion gum, vulcanizing cement/solution have been modified.
d) Test to determine the adhesion values of vulcanizing cement/solution has been added.

In this standard SI units have been used, the unit of force, in Newton (N), of tyre load, in kilogram (kg) and of pressure, in Pascal (Pa). Their relationship are given below for information:

1 kgf	=	9.80 665 N (exactly)
	=	9.81 N (approximately)
	=	10 N (within 2 percent error)
1 kPa	=	0.01 kgf/cm^2 (within 2 percent error)
1 kgf/cm^2	=	98.066 kPa

NOTE — Values of kPa rounded to the nearest practical unit.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Indian Standard

AUTOMOTIVE VEHICLES — RETREADING OF TYRES BY THE PRE-CURED PROCESS — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers the retreading of tyres, by the pre-cured tread process, for passenger cars, light-trucks, trucks and buses, lays down requirements for the casings, the methods of retreading, and the equipment to be used, as well as for the finished product.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS/ISO No.	*Title*
3400 (Part 1) : 2012/ ISO 37 : 2011	Methods of test for vulcanized rubber Determination of tensile stress — Strain properties (*third revision*)
(Part 2) : 2014/ ISO 48 : 2010	Rubber, vulcanized or thermoplastic — Determination of hardness (Hardness between 10 IRHD and 100 IRHD) (*fourth revision*)
(Part 4) : 2012/ ISO 188 : 2011	Accelerated ageing and heat resistance (*third revision*)
(Part 9) : 2014/ ISO 2781 : 2008	Rubber, vulcanized or thermoplastic — Determination of density (*third revision*)
(Part 17) : 1974	Tear strength — Angular test piece
13531 : 2005	Automotive tyres — Tyre re-treading materials for mould cure process (*first revision*)
ISO 289-2-1994	Rubber, unvulcanized — Determinations using a shearing-disc viscometer — Part 2: Determination of pre-vulcanization characteristics
ISO 6502-1999	Rubber — Guide to the use of cure meters
15731 : 2006	Automotive tyres — Selection and inspection of Retreadable Tyre casing
15780 : 2007	Automotive tyres — Repair of tyres and tubes used on motor vehicles

3 DEFINITIONS

For the purpose of this standard the definitions given in IS 13531 and the following shall apply.

3.1 *Buzz-Out* — The buffed area resulting from rasping (buzzing-out) of a spot injury during its preparation for repair.

3.2 *Pre-cured Tread Process* — A method of retreading tyres in which a vulcanized rubber tread is bonded to the buffed casing by means of a layer of un vulcanized rubber bonding material that is subsequently vulcanized by the application of heat and pressure.

4 REQUIREMENTS

4.1 Material

Tread rubber and other material used in the retreading of tyres by the pre-cured tread process shall comply with the requirements given in Annex A.

NOTE — As material supplied by different manufacturers are not necessarily interchangeable, the advice of the suppliers of the materials concerned must be sought before materials are interchanged.

4.2 Casings

Casings taken up for retreading shall be acceptable in accordance with IS 15731 and classified in accordance with IS 15780.

4.3 Freedom from Defects

When examined in accordance with **8.1**, each casing accepted for retreading shall comply with the following requirements:

a) Outer surface shall be free from signs of aging, side-wall cracking (other than superficial weather-checking), damage caused by chemicals, oil water, or heat and looseness of the breaker edge.

b) Inner surface shall be free from damage cords, loose cords and other evidence of under-inflation or run-flat.

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c) Steel bead wires shall show no sign of damage, break, or undue distortion and shall not be exposed.

d) Casing shall be dry, and shall be free from any sign of inherent carcass defects and permanent irregular deformation.

e) Tread shall be free from separation that cannot be removed by buffing.

f) Number and extent of permissible (determined in accordance with defects shall not exceed a combination of the appropriate maximum given in IS 15780).

g) The through cut shall not exceed the following limits:

1) *Crown area* – The number of through cuts shall not exceed 3 patches, and

2) *Shoulder / Sidewall* — The number of through cuts shall not exceed 3 patches.

h) In the case of steel-reinforced casings, the reinforcement shall be free from excessive rust (The majority of steel casing will contain some minor rust once they are used.).

j) Tyres shall not have large through cuts and breaks that are beyond repairs.

5 REQUIREMENTS FOR THE RETREADING PROCESS

5.1 Method of Retreading

Casings shall be retreaded by an approved pre-cured process that is in accordance with the applicable procedures given in **5.5, 5.6** and **5.7**.

5.2 Individual Records

The following details of each casing shall be determined and recorded during processing and this record shall accompany the casing throughout the whole retreading process:

a) Buffed circumference, buffed width;
b) Rim width when relevant;
c) Bag or envelope in which vulcanization is to take place when relevant; and
d) Number of repairs required

5.3 Repairs

Permissible defects (as given in repair of tyres and tubes used on motor vehicles IS 15780) shall be repaired in accordance with the specification for repairs. All buffing dust shall be removed in such a manner as to prevent contamination of the buffed surface. Casings repaired and cured after buffing shall be brushed off with wire brush or spot cleaned with appropriate cleaner, if necessary (Rebuffing may remove too much undertread or cause repairs to loosen. Most retread locations repair after buffing the casing as a standard procedure and additional cleaning is rarely necessary.).

5.4 Buffing

5.4.1 *Location*

The buffing operation shall be carried out in a separate bay or room, that is so constructed and isolated that no buffing dust can spread to other parts of the factory unless a properly sized dust collection system is used.

5.4.2 Process

5.4.2.1 Buffing shall be carried out by means of a motor-driven buffing machine. The buffed contour shall be that as recommended by the original tyre manufacturer and shall be achieved by means of a template, or adjustable radius settings or computerized system. The buffed area on a casing shall be limited to that area which is to be covered by the pre-cured tread and shoulders shall be of equal circumference. The buffed width shall be restricted to the extent recommended by the tyre manufacturer. In any case, excessive trimming results in the exposer of any carcass plies or breaker plies is not permissible. The buff width shall not be wider than the width of pre-cured tread used by 10 mm (Standard procedure is to trim the shoulders slightly to give a best fit to the casing and tread but not to exceed manufacturer's limits).

5.4.2.2 The buffed surface shall be uniform, free from particles of loose rubber, foreign objects, moisture, furrows, channels and loose plies or breakers and from burn or scorch marks caused during buffing and shall have a smooth finish. The recommended buffed texture is RMA-3 or 4.

5.4.2.3 A casing with a shoulder design that incorporating deep scallops shall be so prepared as to provide a firm foundation and support for the pre-cured tread. The alternative and preferred method should be to use a tread design that matches the original design.

5.4.3 *Inspection*

After buffing, each casing shall be inspected (great care being taken to ensure that the buffed surface does not become contaminated) to ensure compliance with the classification and dimensional requirements and the freedom from the following:

a) Looseness of breaker edge;
b) Contamination of the buffed surface;
c) Injuries not detectable or detected before buffing;
d) Damage or injuries caused by buffing (*see* **5.4.2**);
e) Any other defects (*see* **4.2.1**); and
f) Embedded foreign objects.

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Embedded foreign objects shall be removed and all surface cuts and permissible defects shall be buzzed out to firm material before final inspection and authorization of further processing.

5.4.4 *Transportation and Storage*

Buffed surface shall be protected from contamination, and shall be transported preferably on trolleys or monorails avoiding direct contact with the floor and stored in clean areas reserved specifically for such casing. A buffed surface that becomes contaminated shall be re-buffed before further processing of the casing (Monorails have become an industry standard for transporting in-process casings from step to step).

5.5 Cementing

5.5.1 *Location and Equipment*

Cementing shall be carried out in a well-ventilated room or bay, and both the room/bay and the equipment shall be kept clean and free from dust. If the cement is not compatible with cements used in the other processes, it shall be applied by means of an equipment reserved specifically for the process and after the advise of the suppliers of material.

5.5.2 *Application*

The cement shall be applied to the buffed surface of a casing as soon as possible after buffing, and in all cases within 24 h (within 3 days with polyethylene protection on the buffed surface allowing no space for oxidation and contamination that is polythene should be clean) of the completion of buffing. A buffed casing left uncemented for more than 12 h shall be re-buffed before further processing so as to remove any oxidation or contamination. In the case of exposed steel cord reinforcement, the steel cord shall be preferably cemented within 15 min. of the completion of the reparation of the cord.

5.5.2.1 The cement shall be thoroughly mixed before use, and shall be applied by the method specified by its supplier and so as to ensure uniform coverage over the entire buffed area. If it is to be applied by means of an air-operated spray gun, the air must be completely dry and oil-free. If required the cement may be diluted with SBP spirit or equivalent/solvent. Contaminated petrol shall not be used for diluting. When applied by a brush, a stippling action used and care shall be taken to ensure that the brush does not come into contact with unbuffed surface of the casing or any other contaminated surface.

5.5.2.2 The cement surface shall be checked to ensure freedom from buffing dust, and then allowed to dry in clean areas reserved specifically for such casings the length of time specified by the supplier of cement. Weaving should be avoided.

5.5.3 *Transportation and Storage*

Cemented surface shall be protected from contamination, and shall be transported clear of the floor and stored in clean areas reserved specifically for such casings. If a casing with cemented surfaces becomes contaminated, the contamination shall be removed and the surface shall be re-cemented before further processing.

5.6 Building and Trend Application

5.6.1 *General*

A cemented casing shall be built up within the time limit specified by the supplier of the cement. A cemented casing that is not built up with this period, shall be re-cemented before further processing. The cemented surface shall not be handled during the building and tread application. All processing shall be carried out in a clean area reserved specifically for these purposes.

5.6.2 *Filling*

All buzz-outs shall be filled with a suitable rubber material so stitched as to prevent the entrapment of air, and the material then trimmed flush and level with the contour of the buffed surface. When necessary, deep scallops in a shoulder shall be built up (with suitable material) as to provide a firm base for the pre-cured tread, and then so stitched as to prevent the entrapment of air.

5.6.3 *Bonding Material*

The bonding material shall be compatible with the tread rubber used, have a width not less than that of the tread rubber and shall be in sheet form, completely protected by a suitable backing film.

5.6.4 *Tread Rubber*

The tread rubber (*see* **4.1**) shall be in the form of a pre-cured strip, of the appropriate dimensions specified in, and having the appropriate tread design (*see* **6.3**) moulded in the surface of the pre-cured tread (or when relevant, of the attached bonding strip) to be bonded to the prepared casing. It shall be clean and shall be treated as specified by its manufacturer.

5.6.5 *Application*

When bonding material of the type given in **5.6.3** is used, one of the following procedures shall be used to secure it to pre-cured tread rubber and the casing:

a) Tread rubber shall be laid, tread down, on a clean table, any protective film removed and cement applied to the whole area of the

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cleaned upper surface. If a brush is used to apply the cement, the brush shall be cleaned. The cement shall be allowed to dry for the period specified by its manufacturer. If the tread belts are supplied with the cement already applied, then the tack of the surface shall be checked as per the specification of the tread manufacturer. In case of insufficient tack, a fresh cement recommended by the manufacturer shall be applied evenly to the whole area of the tread rubber. The cemented tread shall be allowed to dry thoroughly. In case more than one piece of tread rubber has to be applied to the tyre, then all ends shall be cut square and buffed cleaned. However, there shall be no more than 2 pieces with the shorter piece being at least 300 mm in length. The bonding material shall be applied directly to the casing without removing the protective film. No more than one layer of bonding material shall be applied to the casing and the overlap at the joint shall not be more than 5 mm. The bonding material alongwith the protective film shall be stitched on a mechanical builder with low pressure (about 1.4 kg/cm or 20 psi) as given in **5.6.6**.

b) Bonding material and precured tread rubber shall be measured and using a tool that provides clean cuts, cut to the required length on a clean table reserved specifically for the purpose. The tread rubber shall consist of not more than two pieces. The length of the shorter piece being at least tread rubber shall be laid, tread down, on the clean table and any protective film removed, and cement applied to the whole area of the cleaned upper surface. If a brush is used to apply the cement, the brush shall be clean. The cement shall be allowed to dry for the period specified by its manufacturer.

The exposed surface of the bonding material shall be so fitted as to cover the whole of the cement treated surface of the pre-cured tread and the two components stitched together (avoiding the entrapment of air) with the use of a set of clean rollers and care being taken to avoid con-tamination. Excess bonding material shall be trimmed off. Protective films shall not be removed until absolutely necessary and no clean surface shall be allowed to become contaminated in any way.

The new rubber shall be so applied as to ensure an even tension around the entire circumference of the tyre. After its application, enough pressure shall be applied to the surface of the pre cured tread rubber (commencing at the centre to cause adhesion of the bonding gum to the cemented surface, but not sufficient to cause new rubber to crawl or to bunch up ahead of the stitching roller. Joints (splices shall be lined up and secured. Care shall be taken to avoid displacement. The bonding material shall stretch on the mechanical builder with sufficient pressure.

5.6.6 The application of the tread rubber treated as per **5.6.5** shall be carried out by means of a motor driven air inflated machine. Stitching of the bonding material and the tread rubber to the casing shall be done by positive methods like mechanical, pneumatic or hydraulic actuators.

In the case of application as given in **5.6.5** (a), the excess tread rubber shall be cut square and buffed clean. The tread shall not be cut too short or too long but cut in such a manner that there is no residual stress at the splice.

5.6.7 *Transportation and Storage*

Built up casings shall not be exposed to elevated temperature and care shall be taken to prevent contamination of the tread areas and to prevent distortion or displacement (or both) of the new rubber during storage and transportation.

5.7 Vulcanization

5.7.1 The vulcanization of the built up casing shall be done only with the use of flexible rubber envelopes. The envelopes shall be either of the type which is sealed with a tyre at the shoulder (half skirt) or at the bead (full skirt). The tyres shall be wicked to remove any trapped air between the casings and the envelope by a method recommended by the manufacturer. All steel radial casings can be vulcanised either inflated or uninflated but nylon casings need to be vulcanised in inflated condition using the recommended rim width in any case, in a relaxed and undistorted condition. Nylon casings are also to be cooled down immediately after vulcanisation in the inflated condition.

5.7.2 The conditions of time, temperature and pressure shall be controlled, and shall be followed as recommended by the bonding material manufacturer. These conditions shall be such as to ensure complete vulcanization of the bonding material and complete bonding to each other of the pre-cured tread rubber, bonding material and buffed casing. The temperature shall be uniform throughout the autoclave and pressure shall be so distributed over the tread as to ensure that the bonding material is under uniform pressure.

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6 REQUIREMENTS FOR RETREADED TYPRE

6.1 Freedom from Defects

When examined in accordance with **8.1** each retreaded tyre shall be free from the following:

a) Unrepaired injuries;
b) Repairs to injuries other than permitted in terms of **4.2**;
c) Repairs not carried out in accordance with the specification for tyre repairs;
d) Creasing, buckling and stretching of the carcass or bead;
e) Uneven flow of bonding material;
f) Open splices; and
g) Signs of ply, casing, or tread separation.

6.2 Workmanship

The surface of the tyre shall be clean and free from spew. The outside of the tyre may be treated with a finishing coat.

6.3 Tread

The type of tread pattern shall be as specified by the purchaser, shall be suitable for the class of casing (*see* **4.1**), The centre of the line of the tread shall coincide with the circumferential centre line of the casing and the tread shall show no signs of displacement, or variation in high or low shoulder.

6.4 Dimensions

The top width of the tread shall be at least 90 percent of that of a new tyre having a similar tread pattern. When measured at the groove nearest to the circumferential centre line of the tyre, the thickness of the undertread and skid depth of the pre-cured treads shall conform to the appropriate values given in Table 1.

6.5 Suitability for Service

When fitted (together with a tube in the case of a non-tubeless tyre) to an appropriate rim and inflated to the recommended pressure, a reconditioned tyre shall recover the correct shape and in the case of a tyre for a passenger car or light commercial vehicle shall be concentric with the rim and shall be capable of being balanced.

6.6 Adhesion

The adhesion between the buffed surface of the casing, the cushion gum and the pre-cured tread rubber, determined in accordance with **8.2** and shall be at least 14 N/mm of width.

7 MARKING

The retreader's name or source of manufacture or trade name/trade-mark shall appear in legible and durable markings on each retreaded tyre.

8 METHODS OF INSPECTION AND TEST

8.1 Inspection of Original Casings and Retreaded Tyres

Check for compliance with **4.2** and **6.1** by using the relevant method given in IS 13531.

8.2 Adhesion Between Casing and Tread Rubber of Retreaded Tyres

Check for compliance with **4.2** and **6.1** by using the relevant method given in IS 13531.

8.3 Dimensions of Defects and Injuries

Use the relevant method given in IS 13531.

Table 1 Dimensions of Tread
(*Clause* 6.4)
All dimensions in millimetres.

Sl No.	Type of Vehicles	Undertread mm, *Min*	Skid Depth mm, *Min*	
			Highway	Traction
(1)	(2)	(3)	(4)	(5)
i)	Passenger car	1.6	7.0	—
ii)	Light commercial vehicle	1.6	8.5	11.0
iii)	Truck and bus Tyre section width:			
	a) Less than 9.0 inch	2.5	12.0	14.0
	b) Over 9.0 inch	2.5	12.5	15.0

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ANNEX A

(*Clause* 4.1)

RAW MATERIAL REQUIRED FOR PRE-CURED RETREADING PROCESS

A-1 PRE-CURED TREAD RUBBER

A-1.1 Should have a minimum hydrocarbon content of 50 percent to ensure adequate wear performance.

A-1.2 Should have adequate under tread not less than 20 percent of the total tread thickness. The bottom surface of the tread should be well sanded or brushed to RMA-3.

A-1.3 It shall conform to the requirements laid down in Table 2.

A-2 BONDING GUM

A-2.1 Should be made of natural rubber and should have excellent tack. The material shall be protected with proper plastic lining. The cure rate of bonding gum should match the temperature system adopted in the precured bonding chambers.

A-2.2 It shall conform to the requirements laid down in Table 3.

A-3 FILLING MATERIAL

A-3.1 Should have the same characteristics and specifications of the bonding gum material, but in different thickness to suit the filling requirement.

A-3.2 It shall conform to the requirements laid down in Table 3.

A-4 CEMENT

A-4.1 The cure rate of cement should match the temperature system adopted. The cement should have excellent tack. Solution used must enable the cement to dry up within a reasonable time period as specified by the user.

A-4.2 It shall conform to the requirements laid down in Table 4.

A-5 ENVELOPE

Should be made of butyl compounds or any other superior material as agreed to between the manufacturers and the users to resist temperature and frequency of use. It shall be elastic enough for easy application on the tyre.

Table 2 Physical Properties for Precured Tread Rubber

(*Clause* A-1.3)

Sl No.	Test Parameters	Requirements of IS 15524	Method of Test, Ref to Part of IS 3400
(1)	(2)	(3)	(4)
i)	a) Appearance	The material shall have smooth finish without any blemishes like starvation dirty moulding blisters, free from foreign material, porosity. Bottom surface shall be buffed to RMA-3 Standard	—
	b) Trade-mark	Marking on top the tread shall include name of manufacturer/trade-mark and size	—
	c) Tread wear indicators	Each tread shall have tread wear indicators at least 6 Nos. spaced equally around the circumference as per IS 10914	—
	d) Width thickness and tread base	As agreed to between the manufacturer and the purchaser	—
ii)	Specific gravity (*Max*)	1.20	(Part 9)
iii)	Hardness IRHD/Durometer, Shore-A	55 - 70	(Part 2)
iv)	Stress-Strain properties:		
	a) 300 percent modulus, (kg/cm^2), *Min*	70	(Part 1)
	b) Tensile strength, (kg/cm^2), *Min*	150	(Part 1)
	c) Elongation at break percent, *Min*	300 (Radial) 400 (Bias)	(Part 1)
v)	Air ageing change in physical properties after 120 ± 2 h at 70 ± 2°C		
	a) Hardness IRHD/Shore-A	± 5 Units	(Part 2)
	b) Tensile strength percent, *Max*	–20	
	c) Elongation at break percent, *Max*	–20	

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Table 3 Physical Properties for Bonding/Cushion Gum (Independently Curable)
(*Clause* A-2.2)

Sl No.	Test Parameters	Requirements	Method of Test, Ref to Part of IS 3400
(1)	(2)	(3)	(4)
i)	a) Appearance	The material shall have smooth finish and free from foreign material, ,cure bits, lumps and blisters, wrinkles and kinks	—
	b) Dimensions	Thickness 1.2 mm or as detailed earlier or as agreed upon	—
ii)	Specific gravity (*Max*)	1.13	(Part 9)
iii)	Scorch time, *Min* (t_5 at 138 ± 1°C) *Min* t_5 (Time for 5 units rise from minimum viscosity) at 138 ± 1°C), *Min*	3	ISO 289-2-1994
iv)	Optimum cure time (t_{90} at 138 ± 1°C), *Min* NOTE — Time must be related with O.C.T. of black vulcanising cement and as per the system of curing suggested by the manufacturer.	10-20	ISO 6502-1999
v)	Hardness IRHD/Durometer, Shore-A	45 to 60	(Part 9)
vi)	Stress-Strain properties:		
	a) 300 percent modulus (kg/cm^2), *Min*	50	(Part 1)
	b) Tensile strength (kg/cm^2), *Min*	170	(Part 1)
	c) Elongation at break percent, *Min*	450	(Part 1)
vii)	Angle tear, kgf/mm, *Min*	5.0	(Part 17)

Table 4 Physical Properties for Vulcanising Cement/Solution
(*Clause* A-4.2)

Sl No.	Test Parameters	Requirements	Method of Test, Ref to Part of IS 3400	Annex
(1)	(2)	(3)	(4)	(5)
i)	Visual examination	The cement shall have uniform consistency and no sedimentation	—	—
ii)	Specific gravity, *Max*	1.13	(Part 9)	—
iii)	Scorching time, *Min* (t_5 at 138 ± 1°C) *Min* t_5 (Time for 5 units rise from minimum viscosity)	3	—	—
iv)	Optimum cure time (t_{90} at 138 ± 1°C) *Min*	15- 25	—	—
v)	Hardness IRHD/durometer, Shore-A	40-50	(Part 2)	
vi)	Stress-strain properties:			
	a) 300 percent modulus (kg/cm^2), *Min*	45	(Part 1)	
	b) Tensile strength (kg/cm^2), *Min*	175	(Part 1)	
	c) Elongation at break percent, *Min*	500	(Part 1)	
vii)	Angle tear, kgf/mm, *Min*	5.0	(Part 17)	
viii)	Drying : Touch dry time minimum at 25°C to 40°C and 70 RH, *Max*:			
	a) Spray application	10 to 20 min		
	b) Brush application	30 to 40 min		
ix)	Total solid content percent by mass, *Min:*			
	a) Spray application	8		A
	b) Brush application	10		
x)	Cured pull test adhesion, (kgf/mm), *Min*	5/25		B

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ANNEX B

(*Table* 4)

TO DETERMINE THE ADHESION VALUES OF VULCANISING CEMENT / SOLUTION

B-1 EQUIPMENT USED

B-1.1 Scissors

B-1.2 Lab Curing Press

B-1.3 Slicing/Strip Cutting Machine

B-1.4 Adhesion Tester Machine

B-2 SAMPLE PREPARATION

B-2.1 Cut the strip of thickness 2.5mm, 1 inch wide and 6 inch long from the buffed tread.

B-2.2 Vulcanizing solution is applied on the buffed tread surfaces. Applied area is 4 inch long, 1 inch wide.

B-2.3 Cushion sample of 4 inch long and 1 inch wide is made ready.

B-2.4 Drying time of cement on the tread surface is given approx 15 min at ambient temperature.

B-2.5 After drying cushion piece is placed on one of the cemented tread surface by pressing.

B-2.6 Other cemented tread piece is then adjoined exactly over the cushion which has been applied to the tread and pressed.

B-3 CURING

B-3.1 For curing the sample is placed into the lab press mould and close the press.

B-3.2 Start the curing.

B-3.3 Lab press curing is done by keeping the following parameters which are to be strictly followed:

Temperature: 150 + 2°C, Time: 25 min,
Pressure: 50 kg/cm^2

B-3.4 Remove the sample when cure time is complete.

B-3.5 Cool the samples until lab room temperature is reached (25°C) or let the samples be on lab table as it is for minimum 6 h until lab room temperature is reached before pulling adhesion.

B-4 TESTING PROCEDURE

B-4.1 One piece of tread (open end) is placed in stationary grip of the adhesion tester.

B-4.2 Other piece of tread is placed in the moving grip clamp.

B-4.3 Then sample is pulled until break/separate into two pieces.

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TO

IS 15524 : 2018 AUTOMOTIVE VEHICLES — RETREADING OF TYRES BY THE PRE-CURED PROCESS — SPECIFICATION

(First Revision)

(*Page* 7, *Table* 3) — Substitute the following for the existing table:

Table 3 Physical Properties for Bonding/Cushion Gum (Independently Curable)

(*Clause* A-2.2)

Sl No.	Test Parameters	Requirement	Method of Test, Ref to Part of IS 3400
(1)	(2)	(3)	(4)
i)	a) Appearance	The material shall have smooth finish and free from foreign material, ,cure bits, lumps and blisters, wrinkles and kinks	—
	b) Dimensions	Thickness 1.2 mm or as detailed earlier or as agreed upon	—
ii)	Specific gravity (*Max*)	1.13	(Part 9)
iii)	Scorch time, *Min* (t_5 at 138 ± 1°C) *Min* t_5 (Time for 5 units rise from minimum viscosity) at 138 ± 1°C, *Min*	3	ISO 289-2-1994
iv)	Optimum cure time (t_{90} at 138 ± 1°C), *Min*	10-20	ISO 6502-1999
	NOTE — Time must be related with O.C.T. of black vulcanising cement and as per the system of curing suggested by the manufacturer.		

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Table 3 (*Concluded*)

Sl No.	Test Parameters	Requirement	Method of Test, Ref to Part of IS 3400
(1)	(2)	(3)	(4)
v)	Hardness IRHD/Durometer, Shore-A	45 to 60	(Part 9)
vi)	Stress-Strain properties:		
	a) 300 percent modulus (kg/cm^2), *Min*	50	(Part 1)
	b) Tensile strength (kg/cm^2), *Min*	170	(Part 1)
	c) Elongation at break percent, *Min*	450	(Part 1)

(*Page* 7, *Table* 4) — Substitute the following for the existing table :

Table 4 Physical Properties for Vulcanising Cement/Solution

(*Clause* A-4.2)

Sl No.	Test Parameters	Requirement	Method of Test, Ref to Part of IS 3400	Annex
(1)	(2)	(3)	(4)	(5)
i)	Visual examination	The cement shall have uniform consistency and no sedimentation	—	—
ii)	Specific gravity, *Max*	1.13	(Part 9)	—
iii)	Drying : Touch dry time minimum at 25°C to 40°C and 70 RH, *Max*:			
	a) Spray application	10 to 20 min		
	b) Brush application	30 to 40 min		
iv)	Total solid content percent by mass, *Min:*			
	a) Spray application	8	A	
	b) Brush application	10		
v)	Cured pull test adhesion, (kgf/mm), *Min*	5/25	B	

(TED 07)

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